



IRRIGATED FIELD CROP PRODUCTION TECHNICIAN

Course: Irrigation Processes and Practices 33

Program: Green Certificate

Credits: 6

Corequisite: CTR1210: Personal Safety (Management)


Note: Students are required to complete the corequisite course prior to or concurrent with their enrollment in the first course of the Irrigated Field Crop Production Technician specialization.

Description: Students demonstrate the ability to handle, operate and maintain irrigation equipment according to a farm's protocol and following related legislation; prepare and secure piped systems for winter storage; care for crops by identifying signs of pests, disorders and diseases; demonstrate a working knowledge of a farm's marketing plan; demonstrate a positive attitude toward safety; and demonstrate effective and appropriate employability skills.

Parameters: Each of the three courses that constitute the Irrigated Field Crop Production Technician specialization is designed to be delivered off campus. The annual inspection and approval of the work station, and the monitoring, supervision and assessment of each student's progress and performance must be done in accordance with the procedures specified in the Off-Campus Education policy.

Curriculum and Assessment Standards

Prescribed General Outcomes	Assessment Criteria and Conditions	Suggested Emphasis
<p><i>The student will:</i></p> <ul style="list-style-type: none"> demonstrate the ability to handle, operate and maintain irrigation equipment, by: <ul style="list-style-type: none"> demonstrating health and safety knowledge relating to irrigation systems performing preseason irrigation system checks maintaining the water supply system describing irrigation regulations and by-laws 	<p><i>Assessment of student achievement should be based on:</i></p> <ul style="list-style-type: none"> ongoing assessment of student performance, which is conducted: <ul style="list-style-type: none"> on a daily basis by the student's on-farm trainer in regular consultation with the student's supervising teacher certification testing, which is conducted by a Green Certificate Assessor designated by AAFRD and includes: <ul style="list-style-type: none"> a performance assessment of practical knowledge and skills a written examination. <p>Successful completion of this course will be credited toward the attainment of the Irrigated Field Crop Production Green Certificate Technician credential.</p>	60%



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Parameters: Each of the three courses that constitute the Irrigated Field Crop Production Technician specialization is designed to be delivered off campus. The annual inspection and approval of the work station, and the monitoring, supervision and assessment of each student's progress and performance must be done in accordance with the procedures specified in the Off-Campus Education policy.

Curriculum and Assessment Standards

Prescribed General Outcomes	Assessment Criteria and Conditions	Suggested Emphasis
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Course: Irrigation Processes and Practices 33 (continued)

Prescribed General Outcomes	Assessment Criteria and Conditions	Suggested Emphasis
<p><i>The student will:</i></p> <ul style="list-style-type: none"> – describing farm crop plans – operating wheel move systems – operating a pivot system – operating a water pumping system – monitoring irrigation systems – preparing and securing piped systems for winter storage <ul style="list-style-type: none"> • care for crops, by: <ul style="list-style-type: none"> – identifying signs of pest damage in grain crop fields – identifying signs of diseases and disorders in grain crop fields • demonstrate a working knowledge of the farm's marketing plan or program • demonstrate a positive attitude toward safety, including: <ul style="list-style-type: none"> – farm equipment safety – safe work habits • demonstrate effective and appropriate employability skills. 		<p></p> <p>10%</p> <p>10%</p> <p>10%</p> <p>10%</p>

Course: Irrigation Processes and Practices 33 (continued)

Concept	Prescribed Specific Outcomes	Notes
<p>Irrigation Equipment</p> <ul style="list-style-type: none"> • Health and Safety Knowledge 	<p><i>The student will:</i></p> <ul style="list-style-type: none"> • identify and describe hazards associated with operating irrigation equipment during electrical storms • describe operator techniques that minimize risk or loss due to electrical storms • identify and describe the hazards associated with water under pressure in the systems • describe operator techniques that can minimize risk or loss when working with water under pressure • identify and describe the use of electricity in irrigation systems • identify and describe hazards associated with the use of electricity in irrigation systems • describe operator techniques that can minimize risk or loss when working with electricity • identify and describe hazards associated with the use of long and, if available, automated irrigation piping systems • describe operator techniques that can minimize risk or loss when working with long and, if available, automated irrigation piping systems • describe the basic components of a canal water distribution system, including: <ul style="list-style-type: none"> – reservoir – canals – ditches • describe systems used to increase or decrease water flow in canals • identify and describe hazards associated with canal water distribution systems • describe operator techniques that can minimize risk or loss when working with canal water distribution systems 	<p>Significant injuries or death can result from improper handling and operation of irrigation equipment.</p> <p>Students should be fully informed and trained in proper procedures for handling and working with irrigation systems before being allowed to handle any of the equipment, including:</p> <ul style="list-style-type: none"> • correct operating procedures to follow during lightning storms • proper types and use of personal protective equipment. <p>Hazards of working with high water pressure include:</p> <ul style="list-style-type: none"> • blown-off end caps • disconnected pipe couplings • flying pipes • disconnected sprinkler heads. <p>Operators are expected to regularly check equipment to ensure its proper operation and to ensure that proper fastenings are in place.</p> <p>Proper operation and handling of electrical equipment will minimize the risk of electrical shock. Proper handling includes:</p> <ul style="list-style-type: none"> • ensuring that there are protective covers on electrical controls • replacing worn or damaged cables • wearing proper personal protective equipment.
(continued)		

Course: Irrigation Processes and Practices 33 (continued)

Concept	Prescribed Specific Outcomes	Notes
<p>(continued)</p> <ul style="list-style-type: none"> Health and Safety Knowledge 	<p><i>The student will:</i></p>	<p>Piping can extend to 40 kilometres or more in length. Improper handling of these lengths of piping can result in severe electrical shock if contact is made with a power line.</p> <p>Hazards of canal water distribution systems include:</p> <ul style="list-style-type: none"> slippery, muddy canal banks potential for drowning limited visibility at night.
<ul style="list-style-type: none"> Preseason Irrigation System Checks 	<ul style="list-style-type: none"> identify and describe the basic components of an irrigation system, including: <ul style="list-style-type: none"> water pumping system main line distribution system inspect components of the irrigation and water pumping system identify and describe the purpose of an automatic drain service and repair an automatic drain, and inspect and service/replace water distribution nozzles/sprinkler heads inspect and service/replace a water pump, including a screen intake pipe and other components, as necessary identify and describe power sources used to operate irrigation systems, including: <ul style="list-style-type: none"> electrical natural gas mechanical/combustion explain the operation of a pivot irrigation system inspect wheel motors of a pivot irrigation system for alignment service wheel motors, as necessary 	<p>Irrigation systems that operate effectively are characterized by:</p> <ul style="list-style-type: none"> wheels that are straight and turn true drains that are free from obstruction nozzles that are the proper size hammers and springs that are free from corrosion, binding or broken parts self-levelling nozzles on wheels that are free to swing larger end guns that are free from obstructions regular replacement of worn and leaky gaskets couplers that are intact and accurately hold pipe together electric cable and connectors that are in good condition cooling housing and fan shroud that are clean wheels that are regularly adjusted for proper alignment.

Course: Irrigation Processes and Practices 33 (continued)

Concept	Prescribed Specific Outcomes	Notes
<ul style="list-style-type: none"> Water Supply System 	<p><i>The student will:</i></p> <ul style="list-style-type: none"> identify and describe the most appropriate canal turn-out and water supply control system for the farm's irrigation needs describe the role of irrigation districts in ensuring the availability of water to farms clean up ditches and feeder canals to ensure efficient water flow inspect and clear pipelines for water distribution 	
<ul style="list-style-type: none"> Irrigation Regulations and By-laws 	<ul style="list-style-type: none"> identify and describe sources of information on: <ul style="list-style-type: none"> the local water supply agency municipal by-laws affecting irrigation practices describe key functional irrigation by-laws that affect appropriate placement and delivery systems identify the water supply agency that regulates irrigation operating practices and has cost and legal implications for the farm 	<p>Water is a natural resource, and its access and use are regulated by:</p> <ul style="list-style-type: none"> Alberta Environment municipal irrigation districts. <p>Irrigation regulations may vary among municipalities.</p>
<ul style="list-style-type: none"> Farm Crop Plans 	<ul style="list-style-type: none"> describe a field's recent cropping history and productivity factors, including: <ul style="list-style-type: none"> pest history wet spots soil erosion identify and describe the farm's irrigation method and schedule 	<p>A farm's irrigation method and schedule is determined by the:</p> <ul style="list-style-type: none"> crop to be grown past year's crop proposed marketing of the crop realistic yield expected at cost expected sequence of soil tillage, irrigation, weed and pest practices, and harvesting steps.

Course: Irrigation Processes and Practices 33 (continued)

Concept	Prescribed Specific Outcomes	Notes
<ul style="list-style-type: none"> Wheel Move System 	<p><i>The student will:</i></p> <ul style="list-style-type: none"> describe the basic components of a wheel move irrigation system lay out the main line, and connect the lateral pipe system connect the wheel move system water supply, then flush and pressurize identify nozzles that are not functioning properly, and clean or repair them, as necessary repair or replace leaking pipe couplers follow the correct sequence to shut down and reinstate the water supply system when moving monitor water applications respond appropriately to: <ul style="list-style-type: none"> plugged sprinklers the need to frequently move the wheel line inspect and service the motor drive of the wheel move system 	<p>The basic components of a wheel move system include:</p> <ul style="list-style-type: none"> main line and risers wheel line with connectors valve operation. <p>Typical shut-down sequence includes:</p> <ul style="list-style-type: none"> shutting off the pump closing valves disconnecting the wheel line from the main line allowing drainage. <p>Motor drive service includes inspecting:</p> <ul style="list-style-type: none"> the oil level the gas available the transmission oil level if the transmission plastic housing is in place if the shields/guards are in place.
<ul style="list-style-type: none"> Pivot System 	<ul style="list-style-type: none"> identify and describe the function of key components of the pivot irrigation system identify and describe the hazards, to the operator and equipment, of operating the pivot system identify key operator practices that will minimize risk and loss operate the electrical controls for pumping and pivot motors and control devices monitor and service track fillers use a computer-operated control panel, as available start up the water supply system, and bring the system up to operating pressure unstick a pivot 	<p>Students should be able to identify the control device on the panel.</p> <p>Hazards include:</p> <ul style="list-style-type: none"> components blowing off force of large streams of water lifting and back strain poor footing situations limited nighttime visibility fatigue electrical storms power of electrical lines water around canals and control structures. <p>Students should be able to:</p> <ul style="list-style-type: none"> enter data into an available computer-operated control panel program the water controller to apply the required amount of water.
(continued)		

Course: Irrigation Processes and Practices 33 (continued)

Concept	Prescribed Specific Outcomes	Notes
<p>(continued)</p> <ul style="list-style-type: none"> Pivot System 	<p><i>The student will:</i></p>	<p>In starting up the water supply system, students must ensure that:</p> <ul style="list-style-type: none"> the system is flushed of all material and potential clogs caps and connectors are all in place the system is brought up to operating pressure slowly, while monitoring for proper operation the proper pressure is set and maintained by the system the water supply is sustainable for the desired application.
<ul style="list-style-type: none"> Water Pumping System 	<ul style="list-style-type: none"> monitor and maintain the water pumping system: <ul style="list-style-type: none"> screen boxes water delivery levels engine servicing, on engine operated pumps lubrication, on electric motors identify and describe the components of the water pumping system and their function identify items to be checked, and perform an inspection of the pumping unit prior to start-up prime the pump, and start the flow bring the pumping unit up to full flow and pressure monitor the engine-driven pump, and perform periodic checks and maintenance detect a seized pump, and take corrective action to repair or service it 	

Course: Irrigation Processes and Practices 33 (continued)

Concept	Prescribed Specific Outcomes	Notes
<ul style="list-style-type: none"> Monitoring Irrigation Systems 	<p><i>The student will:</i></p> <ul style="list-style-type: none"> identify activities and components that must be monitored when irrigation is under way detect problems within the watering system identify options for corrective action describe potential emergency situations; e.g.: <ul style="list-style-type: none"> burst main line burst engine unexpected rain power outage describe the farm's emergency services protocol for its irrigation operations determine when a situation is a serious emergency, and respond according to the farm's protocol 	<p>Activities and components requiring monitoring include:</p> <ul style="list-style-type: none"> drainages nozzles pump water supply.
<ul style="list-style-type: none"> Piped System Winter Storage 	<ul style="list-style-type: none"> demonstrate the correct procedure for draining and disconnecting the piping system's components identify and describe the hazards to the operator and to the irrigation system during the winter period park a wheel move at the end of a field for the winter, and ensure that the system is tied down remove water from the main line either when it is on the surface or when it is buried cap the main line properly winterize the pumping systems. 	<p>Winter shut-down and storage procedures are determined by the farm operator and may include:</p> <ul style="list-style-type: none"> guns left in open position to drain pump suction being lifted clear of water and drained any water motors being drained completely to prevent freezing pivot system being positioned downwind for stability. <p>Hazards include:</p> <ul style="list-style-type: none"> freezing of different components of the entire system wind damage to loose systems obstructions in pipes from invading animals and soil or crop debris security from vandalism security from livestock damage personal injuries from handling pipe and components working with cold metal.

Course: Irrigation Processes and Practices 33 (continued)

Concept	Prescribed Specific Outcomes	Notes
<p>Crop Care</p> <ul style="list-style-type: none"> Signs of Insects/Pests 	<p><i>The student will:</i></p> <ul style="list-style-type: none"> identify the most common insect pests that may be found in each field describe each pest's appearance at the damaging stage of its life cycle identify and describe signs of a pest infestation monitor the crop condition, and identify a case of insect damage 	<p>Pests include:</p> <ul style="list-style-type: none"> grasshoppers wireworms cutworms lygus bugs flea beetles. <p>Signs of a pest infection include:</p> <ul style="list-style-type: none"> leaf edge bites. <p>Pest damage includes:</p> <ul style="list-style-type: none"> leaf stripping crop heads clipped wilted plants leaf loss, discoloration heavy insect activity.
<ul style="list-style-type: none"> Signs of Damage Caused by Large and Small Pests 	<ul style="list-style-type: none"> identify expected noninsect pests for each crop and field describe the nature of the loss or damage caused by different pests identify farm practices that encourage or discourage noninsect pest problems demonstrate an ability to detect damage caused by each type of pest: <ul style="list-style-type: none"> gophers—cause grain mounds and bare patches deer—flattening of crops, nibbling of crops elk—grazing of crops 	<p>Noninsect pests and pest damage include:</p> <ul style="list-style-type: none"> rodents—eat very young sprouts. Crop may be cleaned off at ground level mice—chew kernels, shell grain heads deer and elk—trample and bed down on crops ducks—shell grain heads. <p>Farm practices that encourage or discourage noninsect pest problems include:</p> <ul style="list-style-type: none"> security of storage—fencing, buildings state of storage farmyard cleanliness amount of crop left unprotected at harvest time durability of storage materials harvesting strategy wildlife control measures spilled grains.

Course: Irrigation Processes and Practices 33 (continued)

Concept	Prescribed Specific Outcomes	Notes
<ul style="list-style-type: none"> Crop Diseases and Disorders 	<p><i>The student will:</i></p> <ul style="list-style-type: none"> identify common crop diseases and disorders describe the appearance of each disease/disorder at the most damaging stage of its life cycle identify and describe diseases of grain crops identify and describe signs to look for in noticing a crop disease or disorder. 	<p>Grain crop diseases include:</p> <ul style="list-style-type: none"> root rot, characterized by yellow bare patches and prematurity bunt/smoot, a fungal disease causing head of the crop to turn black sclerotinia, a mould that causes the plant to develop a silvery colour and deformities stag head, causing canola crops to develop a black head. <p>Signs of disease include:</p> <ul style="list-style-type: none"> plant deformity abnormal coloration abnormal growth.
Farm Marketing Plan/Program	<ul style="list-style-type: none"> define/explain marketing identify and describe the marketing plan for each of the different crops in the individual fields or locations identify and describe the realistic yield expected from different fields/locations identify and describe key factors, over which the technician may have control, that affect the yield, grade and price of a crop. 	While the technician cannot control the weather, an effective and efficient technician can affect the yield, grade and value of a crop by appropriately monitoring the irrigation system and the use of fertilizers.
<p>Safety</p> <ul style="list-style-type: none"> Farm Equipment Safety 	<ul style="list-style-type: none"> use and care for farm equipment safety devices describe the purpose of safety shields identify common areas of farm machines requiring the use of safety shields locate, read and interpret warning decals, symbols and signs perform a safety inspection of equipment components identify missing, damaged and malfunctioning items 	

Course: Irrigation Processes and Practices 33 (continued)

Concept	Prescribed Specific Outcomes	Notes
<ul style="list-style-type: none"> Safe Work Habits 	<p><i>The student will:</i></p> <ul style="list-style-type: none"> identify types of personal hazards associated with operating machinery and parked equipment identify and describe examples of unsafe clothing when working with farm machinery and farm chemicals identify, describe and demonstrate proper use of personal protective equipment (PPE) when working with farm machinery and farm chemicals demonstrate the ability to maintain tools and work areas in a clean and safe condition locate and ensure the accessibility of fire fighting equipment, a first-aid kit and other safety equipment. 	<p>PPE includes:</p> <ul style="list-style-type: none"> earplugs eye protection devices dust protectors.
<p>Personal Work Skills</p>	<ul style="list-style-type: none"> demonstrate employability skills, including: <ul style="list-style-type: none"> verbal and nonverbal communication goal setting and career planning time management basic financial management. 	<p>Students should be advised that their personal work skills will be expected to improve throughout their involvement in the Green Certificate Program.</p> <p>Assessment of personal work skills will be based on growth from previous assessments of personal work skills.</p>

Course: Field and Crop Preparation 33

Program: Green Certificate

Credits: 5

Corequisite: CTR1210: Personal Safety (Management)

Note: Students are required to complete the corequisite course prior to or concurrent with their enrollment in the first course of the Irrigated Field Crop Production Technician specialization.

Description: Students demonstrate the ability to perform planting activities, by understanding a farm's cropping program, following regulations and operating farm equipment, including cultivators, fertilizer applicators, trucks, tractors and towed implements; use basic servicing tools; demonstrate crop care, by identifying weed infestations and minimizing the introduction and spread of weeds; demonstrate farm safety, including emergency first aid and knowledge of components of fire; and demonstrate effective and appropriate employability skills.

Parameters: Each of the three courses that constitute the Irrigated Field Crop Production Technician specialization is designed to be delivered off campus. The annual inspection and approval of the work station, and the monitoring, supervision and assessment of each student's progress and performance must be done in accordance with the procedures specified in the Off-Campus Education policy.

Curriculum and Assessment Standards

Prescribed General Outcomes	Assessment Criteria and Conditions	Suggested Emphasis
<p><i>The student will:</i></p> <ul style="list-style-type: none">• demonstrate the ability to perform planting activities, by:<ul style="list-style-type: none">– understanding the farm's cropping program– demonstrating knowledge of farm vehicle operation regulations– operating farm vehicles– maintaining tractors– operating loading equipment– operating one-tonne trucks– towing trailers, wagons and other farm vehicles– using basic servicing tools	<p><i>Assessment of student achievement should be based on:</i></p> <ul style="list-style-type: none">• ongoing assessment of student performance, which is conducted:<ul style="list-style-type: none">– on a daily basis by the student's on-farm trainer in regular consultation with the student's supervising teacher• certification testing, which is conducted by a Green Certificate Assessor designated by AAFRD and includes:<ul style="list-style-type: none">– a performance assessment of practical knowledge and skills– a written examination. <p>Successful completion of this course will be credited toward the attainment of the Irrigated Field Crop Production and/or the Field Crop Production Green Certificate Technician credential.</p>	50%

Course: Field and Crop Preparation 33 (continued)

Prescribed General Outcomes	Assessment Criteria and Conditions	Suggested Emphasis
<p><i>The student will:</i></p> <ul style="list-style-type: none"> – operating cultivation implements – servicing seeding machines – operating fertilizer applicators – storing seeding equipment • demonstrate crop care, including: <ul style="list-style-type: none"> – identifying weed infestations – minimizing the introduction and spread of weeds • demonstrate safety practices, including: <ul style="list-style-type: none"> – performing emergency first aid – demonstrating knowledge of components of fire • demonstrate effective and appropriate employability skills. 		<p>30%</p> <p>10%</p> <p>10%</p>

Course: Field and Crop Preparation 33 (continued)

Concept	Prescribed Specific Outcomes	Notes
Planting <ul style="list-style-type: none"> Farm Cropping Program 	<p><i>The student will:</i></p> <ul style="list-style-type: none"> define and distinguish among forage crops: <ul style="list-style-type: none"> hay haylage silage straw identify and describe the following, in basic terms: <ul style="list-style-type: none"> what is planned, prior to the growing season, to be grown in a field what is currently planted what is the most likely intention for marketing the expected crop the realistic yield expected/goals the expected sequence of soil tillage, weed and pest practices harvesting steps expected to be undertaken 	<p>Forage crops include any crop used as cattle feed.</p> <p>Hay is dried forage.</p> <p>Haylage is harvested, stored, fermented forage—barley, corn—short cut with 65% moisture content.</p> <p>Silage is harvested, stored, fermented forage, long cut with 45% moisture content.</p> <p>Straw is residue from a cereal crop.</p> <p>Students will be expected to learn the factors that affect how a field is worked:</p> <ul style="list-style-type: none"> wet spots stones soil erosion timeliness for cropping production level expected. <p>In addition, students will be expected to know what crop production activities will be carried out in each season for each field.</p>
<ul style="list-style-type: none"> Farm Vehicle Road Travel Regulations 	<ul style="list-style-type: none"> identify and describe lighting requirements for trucks and towed equipment on public roads identify and describe the requirements for the posting and placement of slow moving farm vehicle signs identify and describe both the legal and good practice requirements for hitching implements to a tractor identify and describe the requirements of ensuring: <ul style="list-style-type: none"> clear visibility for the operator cleanliness standards for lights and licence plates 	<p>The <i>Highway Traffic Act</i> applies to all vehicles, including farm vehicles.</p> <p>Note: Driving a farm truck with frosted windows is illegal.</p> <p>The following truck equipment must be in good condition and operating order:</p> <ul style="list-style-type: none"> headlights turn signals equipment lights clearance lights reflectors colours allowed/required.
(continued)		

Course: Field and Crop Preparation 33 (continued)

Concept	Prescribed Specific Outcomes	Notes
<p>(continued)</p> <ul style="list-style-type: none"> Farm Vehicle Road Travel Regulations 	<p><i>The student will:</i></p> <ul style="list-style-type: none"> identify and describe operator qualifications and licencing requirements for legal road travel identify and describe width, length and height restrictions for tractors, towed equipment and combines when used on public roads describe and demonstrate the following legal and courteous driving practices when travelling on public roads: <ul style="list-style-type: none"> rights of way travel on shoulder speed limits turning, stopping and signalling yielding obeying signs describe the weight restriction road ban system as it relates to farm truck operations identify and describe the operating requirements for long loads and/or towed equipment describe the basic operating practices required to conform to the: <ul style="list-style-type: none"> <i>Weed Control Act</i> tarping of loads hauling of hay describe the basic programs and issues associated with the spread of certain weeds and pests between regional areas, such as across provincial borders describe how weed and pest issues may affect truck operating practices identify basic tools and emergency equipment required for truck operation on roads identify and describe the signs used to indicate the system of truck routes in cities describe the basic intent of the <i>Dangerous Goods Transportation and Handling Act</i> and how it applies to farm truck operation 	<p>Noxious weeds include:</p> <ul style="list-style-type: none"> scentless chamomile purple loosestrife. <p>The following emergency equipment should be kept in a truck:</p> <ul style="list-style-type: none"> flares flags reflectors tire jack/wrench <i>Motor Vehicle Administration Act</i> <i>Highway Traffic Act.</i>
(continued)		

Course: Field and Crop Preparation 33 (continued)

Concept	Prescribed Specific Outcomes	Notes
(continued)	<i>The student will:</i>	
<ul style="list-style-type: none"> Farm Vehicle Road Travel Regulations 	<ul style="list-style-type: none"> identify and describe regulating bodies and regulations related to the hauling of livestock identify and describe the public liability and general operating insurance requirements for farm trucks operating on public roads identify and describe the procedures necessary for large, oversized loads 	<p>Basic standards of livestock hauling include:</p> <ul style="list-style-type: none"> weather protection floor footing security appropriate loading densities appropriate wall surfaces/internal gates or restraints.
<ul style="list-style-type: none"> Farm Tractor Operations 	<ul style="list-style-type: none"> identify and describe operator platform controls explain the purpose and method of operation of each control describe the information presented on each gauge, and interpret its reading list and describe items to be checked in a walk-around inspection prior to start-up perform inspections prior to start-up on a regular basis demonstrate proper engine start-up procedures identify the recommended range of engine load and rpm, and select the appropriate gear ratio to maintain it, taking into account the job to be done demonstrate proper shifting and clutching procedures demonstrate correct use of independent tractor brakes for a variety of farm jobs select the most appropriate size and power range of tractor to match the capability to the job demonstrate proper and safe procedures to hook up implements, including power take-off (PTO) and hydraulic connections demonstrate safe highway and roadway operating techniques describe field driving situations where there is a danger of rollover 	<p>Tractor controls include:</p> <ul style="list-style-type: none"> switches and buttons hydraulic and power take-off (PTO) controls transmission and low drives, gear selections pedals cab controls and features for operator comfort; e.g., air, heat gauges. <p>When inspecting a tractor, check for:</p> <ul style="list-style-type: none"> loose bolts, chains, belts, wheel belts, broken parts, anything in path or under wheels oil, radiator and/or hose leaks tire condition and pressure, stones in duals, mounts. <p>Engine start-up procedure includes:</p> <ul style="list-style-type: none"> never starting the engine in a closed building idling at low speed until oil pressure is up turning the engine over to get oil to turbo charger proper warm-up of components checking gauges checking for obstacles
(continued)		

Course: **Field and Crop Preparation 33** (continued)

Concept	Prescribed Specific Outcomes	Notes
<p>(continued)</p> <ul style="list-style-type: none"> Farm Tractor Operations <p>(continued)</p>	<p><i>The student will:</i></p> <ul style="list-style-type: none"> demonstrate safe driving practices, which will minimize accidents describe tipping hazards that may result from incorrect hitching to a tractor demonstrate the proper selection and hitching of a towrope or chain for pulling demonstrate proper tractor shut-down procedures 	<ul style="list-style-type: none"> cold weather aids—starter fluids, external heat, booster battery, preheater ensuring the engine is not over cranked following manufacturer's recommendation. <p>In operating a tractor within its engine load:</p> <ul style="list-style-type: none"> a tachometer, pyrometer or temperature gauge is used gear and speed selected match the desired engine loading equipment is run at rated speed, if operating a PTO implement fuel efficiency is optimum engine is operated within manufacturer's guidelines. <p>Shifting and clutching procedures include:</p> <ul style="list-style-type: none"> following the manufacturer's recommendations minimizing clutch and engine stress operating the clutch smoothly caring for freewheeling on slopes using the proper technique for shifting on the go. <p>Tractor brake operation includes:</p> <ul style="list-style-type: none"> using brakes independently when appropriate for low speed turning locking pedals together appropriately for road travel or high speed movement keeping pedals clean. <p>Tractor size and power range factors include:</p> <ul style="list-style-type: none"> tractor used matches size of job

Course: Field and Crop Preparation 33 (continued)

Concept	Prescribed Specific Outcomes	Notes
<p>(continued)</p> <ul style="list-style-type: none"> Farm Tractor Operations 	<p><i>The student will:</i></p>	<ul style="list-style-type: none"> manoeuvrability and traction are considered for corral work and muddy conditions safe backing of tractor low revolutions when close to machines PTO connected without finger pinching all shields are in place and checked for effectiveness and repair needs any tongue jacks or stands are lifted and locked into place.
<ul style="list-style-type: none"> Tractor Maintenance 	<ul style="list-style-type: none"> identify and describe, for each of the fluid or oil levels: <ul style="list-style-type: none"> – maintenance expectations – frequency of maintenance check each fluid and oil level demonstrate correct procedures to change the engine oil and filter demonstrate correct procedures to change hydraulic fuel and water filters describe basic types of greases and oils describe the importance of selecting the right lubricant for the job demonstrate proper gun-filling and greasing techniques identify non-engine points requiring lubrication describe the types of air cleaners found on available tractor equipment identify the frequency for servicing air cleaners demonstrate proper cleaning and servicing procedures for each type of air cleaner found on available equipment 	<p>Fluids, including oils, that must be checked include:</p> <ul style="list-style-type: none"> steering fluid oil water battery fluid transmission and drivetrain fluids differential fluid planetary drive fluid hydraulic fluid. <p>Fuel and water filters must be removed and replaced without damage, by following the manufacturer's recommendations.</p> <p>Grease gun preparation and operation includes:</p> <ul style="list-style-type: none"> proper preparation and insertion of cartridge proper hookup bleeding air cleaning grease fitting before applying grease no excessive waste seals or bearing coverings are not damaged due to overzealous power greasing.
<p>(continued)</p>		

Course: Field and Crop Preparation 33 (continued)

Concept	Prescribed Specific Outcomes	Notes
<p>(continued)</p> <ul style="list-style-type: none"> Tractor Maintenance 	<p><i>The student will:</i></p>	<p>Students will need to know the following information about air cleaners:</p> <ul style="list-style-type: none"> the difference between oil and dry types how each type operates pre-cleaners effects of different work conditions and seasons cab air cleaners and filters service intervals follow manufacturer's recommendations proper disassembly/reassembly use of appropriate cleaners correct use of compressed air to blow clean when new cleaner should be purchased damage from broken filter or faulty seal that the air supply system operates with no leaks.
<ul style="list-style-type: none"> Farm Material Loaders 	<ul style="list-style-type: none"> identify and describe types of loaders used in crop production: <ul style="list-style-type: none"> skid steer forklift front-end loader describe hazards associated with operating front-end loaders describe precautions that should be taken to minimize the effect of each hazard identify items to check before starting any loader perform a walk-around check of a loader demonstrate the safe and efficient operation of the loader to carry out a farm task 	<p>Hazards of operating front-end loaders include:</p> <ul style="list-style-type: none"> tipping—front and back rollover lifting heavy weights up high load falling back on operator hydraulic failures damage from overloading or hitting objects overhead obstructions electrocution from power lines. <p>A walk-around check should include the following, as appropriate:</p> <ul style="list-style-type: none"> hydraulic hoses, pins and connections
(continued)		

Course: Field and Crop Preparation 33 (continued)

Concept	Prescribed Specific Outcomes	Notes
<p>(continued)</p> <ul style="list-style-type: none"> Farm Material Loaders 	<p><i>The student will:</i></p> <ul style="list-style-type: none"> demonstrate safe procedures when working on loader parts or on a tractor with a loader attached perform routine service on the loader operating systems, including the engine and hydraulics 	<ul style="list-style-type: none"> tire pressure and conditions counterbalancing weights secure and adequate structural damage cracks, bends, loose parts. <p>Safe and efficient operation of loaders includes:</p> <ul style="list-style-type: none"> efficient cycling of travel and use of bucket minimum wasted trips due to empty bucket minimum wasted manoeuvring speed being kept to a safe level safe handling, no overloading safe loading and travelling with load watching while backing up and watching for obstructions load being kept low to the ground centre of gravity being kept low controls being operated smoothly. <p>Routine service includes:</p> <ul style="list-style-type: none"> oil being changed at the appropriate time oil being drained and disposed of properly filters being removed and installed with no damage, using correct tools proper oils and filter products being used for the type/use of machine all fluid levels being checked and topped up when necessary inspecting for wear and tear and notifying appropriate staff.

Course: Field and Crop Preparation 33 (continued)

Concept	Prescribed Specific Outcomes	Notes
<ul style="list-style-type: none"> One-tonne Farm Trucks <p>(continued)</p>	<p><i>The student will:</i></p> <ul style="list-style-type: none"> demonstrate proper clutching procedures and gear-shifting techniques demonstrate proper operation of the braking system, under loaded and unloaded conditions, on a variety of ground surface conditions demonstrate proper braking procedures for both air hydraulic brakes and regular brakes identify and demonstrate practical methods for slowing a farm truck identify possible effects of cold weather conditions on the air brake system perform necessary practices to ensure effective air brake operation during cold weather interpret the manufacturer's signs or plates and manual recommendations to determine the load limitations for the vehicle identify and describe hazards associated with a truck hoist demonstrate proper procedures to operate a box hoist identify hazards associated with the loading, supporting, carrying and unloading of various farm commodities in different kinds of vehicles back up a farm vehicle under loaded conditions operate trucks on soft ground, on confined pathways and around other machinery identify and describe hazards associated with truck servicing identify and describe the different lubrication products used on the truck and the main distinguishing feature for each lubricant that makes it appropriate for the job check the condition of and perform service to the coolant system, as necessary 	<p>Special Note: Students must be in possession of, at minimum, a Class 5 operator's licence, in order to operate a single-axle truck on public roads. To operate a multiple-axle truck, operators must have a Class 3 or Class 1 operator's licence and be 18 years of age or older.</p>

Course: Field and Crop Preparation 33 (continued)

Concept	Prescribed Specific Outcomes	Notes
<p>(continued)</p> <ul style="list-style-type: none"> One-tonne Farm Trucks 	<p><i>The student will:</i></p> <ul style="list-style-type: none"> check the condition of and perform service to the battery and basic electrical components, as necessary inspect the wheels and tires, and perform basic service, as necessary check the condition of and perform service to the drivetrain and transmission, as necessary check the condition of and perform needed service to the air cleaner system and any fuel filters check the condition of and perform needed adjustments, where possible, to the brake system perform and complete an oil and filter change and chassis lubrication on the truck 	
<ul style="list-style-type: none"> Trailers and Wagons 	<ul style="list-style-type: none"> identify and describe specific regulations relating to towed equipment identify and describe equipment that can be towed by a truck or tractor: <ul style="list-style-type: none"> wagons grain augers other implements identify and describe hazards associated with the towing of equipment identify and describe the proper procedures for hitching equipment demonstrate proper procedures for backing up and manoeuvring a truck or tractor and its towed equipment into a given place demonstrate safe and appropriate towing of equipment, implements and crop materials around the farm and on roads, by: <ul style="list-style-type: none"> making allowance for turning and length making extra allowance for proper braking properly setting up the hitch and ensuring the tongue load is correct appropriately placing such things as lighting or markers, flags securing crop loads 	<p>Hazards of towing include:</p> <ul style="list-style-type: none"> wide equipment hitting something jack-knifing fishtailing loose parts/equipment poor braking ability rear collisions soft or blown tires effects of heavy load on steering, braking. <p>Equipment to be towed must be securely hitched with safety chains and proper pins.</p> <p>When backing up:</p> <ul style="list-style-type: none"> use mirrors effectively work with a helper using hand signals manoeuvre in reasonable time.

Course: Field and Crop Preparation 33 (continued)

Concept	Prescribed Specific Outcomes	Notes
<ul style="list-style-type: none"> Hand and Shop Tools <p>(continued)</p>	<p><i>The student will:</i></p> <ul style="list-style-type: none"> identify different types and sizes of hand tools and accessories needed on a farm, including: <ul style="list-style-type: none"> screwdrivers hammers chisels wrenches pliers cutters rasps describe and demonstrate the safe and correct use of each type of available hand tool and accessory demonstrate the correct selection and use of hacksaw blades for specific tasks identify different types of power tools commonly used on a farm describe hazards associated with each power tool demonstrate correct use of each available power tool identify and describe the operating features of common farm mechanical jacks: <ul style="list-style-type: none"> jack-all hydraulic jacks—direct vertical lift, or automotive or floor type hand winches identify and describe hazards associated with the use of each type of jack, hoist and any other equipment-lifting device demonstrate safe and efficient operating procedures when using a jack or hoist describe key points of safe usage of blocks and/or jack stands, and demonstrate the best placement and positioning of these items 	<p>Screwdriver types include:</p> <ul style="list-style-type: none"> flat Phillips Robertson. <p>Wrench types include:</p> <ul style="list-style-type: none"> box open adjustable socket. <p>Plier and cutter types include:</p> <ul style="list-style-type: none"> slip joint regular pump type side cutters needle-nose long-nose. <p>Hammer types include:</p> <ul style="list-style-type: none"> nail claw ball-peen mallets sledge. <p>Chisel types include:</p> <ul style="list-style-type: none"> cold wood punches pin centre drift. <p>Rasp types include:</p> <ul style="list-style-type: none"> wood metal fine coarse. <p>Power tools include:</p> <ul style="list-style-type: none"> portable skill saw power drills. <p>Safety hazards of power tools include:</p> <ul style="list-style-type: none"> electric shock from improper grounding or cord damage

Course: Field and Crop Preparation 33 (continued)

Concept	Prescribed Specific Outcomes	Notes
<p>(continued)</p> <ul style="list-style-type: none"> Hand and Shop Tools 	<p><i>The student will:</i></p> <ul style="list-style-type: none"> identify and describe hazards associated with batteries describe procedures to minimize battery hazards demonstrate the correct procedure for hooking up and operating a battery charger demonstrate safe use of booster cables to boost a motor vehicle battery demonstrate correct procedure to obtain an accurate tire pressure reading inflate tires to their proper level of inflation demonstrate correct procedures for checking pressure in a ballasted tire 	<ul style="list-style-type: none"> using tools in wet conditions using tools in crowded, improperly lit or slippery areas flying pieces of work material or broken tools improperly held work piece—wood or metal comes loose injury to hands or body parts from cutting through work wrapping clothing in tool fire from sparks and overheating of work piece. <p>Jack hazards include:</p> <ul style="list-style-type: none"> overloading unstable load ground giving way equipment not properly braked or blocked oil leaks implement tongue jacks collapsing handle flying up damaged or worn cable/chain rust—lack of lubrication. <p>Battery hazards include:</p> <ul style="list-style-type: none"> hydrogen gas produced when charging can result in explosions, if sparked acid splashing or spilling on eyes, skin, clothing frozen battery exploding damage from incorrect polarity.

Course: Field and Crop Preparation 33 (continued)

Concept	Prescribed Specific Outcomes	Notes
<ul style="list-style-type: none"> Cultivators <p>(continued)</p>	<p><i>The student will:</i></p> <ul style="list-style-type: none"> identify and describe the types of cultivation implements available; e.g.: <ul style="list-style-type: none"> ploughs cultivators harrows describe the operation, features and purpose of: <ul style="list-style-type: none"> cultivators harrows discs blades hitch up each available implement identify checking procedures for each implement prior to start-up identify and describe the hazards of operating a cultivation implement on fields and on roads identify and describe procedures to transport cultivation implements on public roads prepare for and transport cultivation equipment on a road identify and describe what constitutes a good job with each implement operate the tractor and cultivation implement to accomplish the expected field work demonstrate efficiency of operation with respect to: <ul style="list-style-type: none"> minimum number of turns width of turn strips manoeuvrability of equipment describing and explaining the “dead” furrows identify the source or cause of a plugged implement demonstrate proper procedures for clearing the obstruction demonstrate proper procedures and precautions prior to working on equipment locate points on the implement in need of lubrication select proper lubricants, and perform necessary lubrication services 	<p>Prior to start-up of implements, check for:</p> <ul style="list-style-type: none"> loose or broken bolts cracked welds or parts chipped or worn blades, shears, teeth missing parts bent parts debris on shovels tire condition bearings on all rotating parts hydraulic hoses; e.g., rubbing, binding, pinches, leaks proper and safe hitching, with appropriate draw pin and safety clip. <p>When operating a tractor with a cultivator, ensure:</p> <ul style="list-style-type: none"> proper operating speed, depth and angle of penetration even penetration wings are penetrating properly machine is pulled in correct lines of draft travel patterns. <p>Effectiveness with implements is variable—it depends on the type of implement and the intended outcome.</p>

Course: Field and Crop Preparation 33 (continued)

Concept	Prescribed Specific Outcomes	Notes
(continued)	<i>The student will:</i>	
<ul style="list-style-type: none"> Cultivators 	<ul style="list-style-type: none"> establish a personal routine or schedule for inspecting a cultivator's blades, teeth, shovels and shears identify broken, damaged or worn-out parts demonstrate proper procedures for changing blades, teeth, shovels and other parts identify the location of information on tire pressure range requirements interpret tire pressure range requirements maintain correct tire pressures and tire condition 	<p>Causes of obstruction include:</p> <ul style="list-style-type: none"> rocks excessive crop residue excessively wet soil improper settings on equipment.
<ul style="list-style-type: none"> Seeding Machines 	<ul style="list-style-type: none"> identify and describe types of seeding machines: <ul style="list-style-type: none"> discer seeder double disc drill disc drill without press wheels end wheel drills hoe drill cultivator seeder—air seeders modified drills for zero-till seed bed broadcast seeder precision seeder, such as a grass or forage seeder identify and describe features of each style of seed placement describe basic advantages and disadvantages of each type of available seeder 	<p>Some common types of seeders include:</p> <ul style="list-style-type: none"> discer seeder—one-way seeder double disc drill—used for grass seeding end wheel drills—used with specialty seeds. <p>In determining the best type of seeder for specific jobs, consider:</p> <ul style="list-style-type: none"> how each operates under what field, soil and seed conditions each is likely to be most effective. <p>Press wheels are used to compress soil after seeding.</p> <p>Hoe drills are used for seeding barley.</p> <p>Note: At the technician level, students generally will not be expected to operate seeders. However, students will be expected to operate cultivation implements.</p>

Course: Field and Crop Preparation 33 (continued)

Concept	Prescribed Specific Outcomes	Notes
<ul style="list-style-type: none"> Servicing Seeding Machines <p>(continued)</p>	<p><i>The student will:</i></p> <ul style="list-style-type: none"> identify items to be included in an inspection of a seeding machine prior to use perform the inspection identify the points on the seeding implements that require lubrication, and carry out a routine of lubrication maintenance perform a preseason inspection of seed delivery tubes, and perform any necessary maintenance inspect furrow or seed placement closure parts, and ensure that wheels or other components are clear and working properly perform necessary servicing and checks: <ul style="list-style-type: none"> on rotating parts on trash-clearing parts to ensure furrow spacing accuracy to ensure opener effectiveness 	<p>Inspections should include a check for:</p> <ul style="list-style-type: none"> blocked runs plugged or broken hoses uneven emptying levelness of machine shafts turning freely worn bearings chain and drivetrain wear uniformity of spring tensions tire inflation. <p>Lubrication maintenance includes:</p> <ul style="list-style-type: none"> referring to the operator's manual ensuring proper frequency of servicing using the proper type/amount of grease/oil checking/inspecting bearings during lubrication checking oil levels in gear boxes lubricating chains ensuring that all grease nipples are functioning properly. <p>When inspecting and maintaining seed delivery tubes:</p> <ul style="list-style-type: none"> identify the condition of seed tubes—rubber, flexible metal care for seed tubes: <ul style="list-style-type: none"> store out of sun keep free of grease/oil clean out fertilizer, metal check for rust, corrosion, inflexibility maintain proper tube length maintain seed tube alignment check for rips, tears, rotten spots, obstructions and pinching of tubes when drill is raised.

Course: Field and Crop Preparation 33 (continued)

Concept	Prescribed Specific Outcomes	Notes
<p>(continued)</p> <ul style="list-style-type: none"> • Servicing Seeding Machines 	<p><i>The student will:</i></p>	<p>When inspecting and maintaining seed placement closure parts:</p> <ul style="list-style-type: none"> • keep press wheels free of roots, rocks, mud • check and service scrapers, tension coulters or knives, wheel bolts, bearings, tires • ensure packer maintenance • check furrow openers for alignment, damage • check that all shafts are turning freely—turn them over by hand before start-up.
<ul style="list-style-type: none"> • Granular Fertilizer Applications 	<ul style="list-style-type: none"> • identify and describe the main components and operation of a granular fertilizer applicator • identify and describe hazards associated with the operation of a granular fertilizer applicator • describe the purpose of marker systems • determine where using a marker system is appropriate • demonstrate the proper procedures for setting up and using a marker system • operate a granular fertilizer applicator in a field to apply a required fertilizer amount • transport the equipment safely from field to field and along public roads 	<p>Note: Equipment will usually be provided for temporary use by a dealer when purchasing the granular fertilizer. Dealers may also provide training in using the applicator.</p> <p>Main components of granular fertilizer applicators include:</p> <ul style="list-style-type: none"> • dribbler—fertilizer boxes, wheel drive mechanism, metering device, rotating shafts, agitators, air applicator types • broadcaster—hopper, power take-off (PTO) drive, floor feed/chain drive, belts, gearboxes, spinner, agitator. <p>Hazards include:</p> <ul style="list-style-type: none"> • chemical burns to skin • danger to respiratory system from dust • width hazards, falling wings.
<p>(continued)</p>		

Course: Field and Crop Preparation 33 (continued)

Concept	Prescribed Specific Outcomes	Notes
<p>(continued)</p> <ul style="list-style-type: none"> Granular Fertilizer Applications Storing Seeding Equipment 	<p><i>The student will:</i></p> <ul style="list-style-type: none"> demonstrate proper procedures for cleaning a seed drill identify requirements other than cleaning that must be met before storing seeding equipment place equipment in storage and/or perform procedures to protect equipment until next season's use. 	<p>The technician will be expected to adjust tractor speed to ensure the correct distribution of fertilizer.</p> <p>Proper cleaning includes:</p> <ul style="list-style-type: none"> removing all seed, fertilizers, sticks, straws, clods, kernels washing drill thoroughly with water cleaning furrow openers cleaning drill tubes. <p>Before storage:</p> <ul style="list-style-type: none"> paint where necessary oil equipment to prevent rust store drill tubes in a clean, dry place raise the drill off the ground block the tires take an inventory of repairs needed.
<p>Crop Care</p> <ul style="list-style-type: none"> Weed Infestations Minimizing Weeds <p>(continued)</p>	<ul style="list-style-type: none"> identify the most common weeds found in each field describe the appearance of each weed at its small and mature stages of growth identify and describe optimum times or stages to monitor for weeds identify and describe: <ul style="list-style-type: none"> plants that are weeds plants that are crops identify and describe various ways that common problem crop weeds are spread describe farming practices that help to spread weeds identify and describe practices that help to prevent or reduce the spread of weeds. 	<p>Students should be able to identify and describe each weed's:</p> <ul style="list-style-type: none"> size/height shape colour leaf shape and colour. <p>Common crop weeds are spread by:</p> <ul style="list-style-type: none"> implements carrying seed or roots using own grain for seed without good cleaning unclean seed uncovered trucks clothing.

Course: Field and Crop Preparation 33 (continued)

Concept	Prescribed Specific Outcomes	Notes
(continued) <ul style="list-style-type: none"> Minimizing Weeds 	<i>The student will:</i>	Weed infestations can be reduced by: <ul style="list-style-type: none"> keeping trucks and implements clean using clean seed keeping machinery clean selecting and purchasing feed grains and forage with care.
Safety <ul style="list-style-type: none"> First Aid <ul style="list-style-type: none"> Components of Fire 	<ul style="list-style-type: none"> perform cardiopulmonary resuscitation (CPR) aid a choking victim treat severe bleeding handle shock <ul style="list-style-type: none"> describe the basic components of fire describe methods of controlling each component of fire identify and describe classes of fires identify the appropriate type of extinguisher material/fire extinguisher for each type of fire identify classes of fires possible: <ul style="list-style-type: none"> on a truck or tractor in a farm shop in a livestock building identify the hazardous areas and seasonal factors affecting fire risk: <ul style="list-style-type: none"> on a truck or tractor in a farm shop in a livestock building assess the cause or source of a fire, and take steps to prevent reignition. 	Students should have completed or be in the process of completing the emergency first aid course, which is a component of CTR1210: Personal Safety (Management). Basic components of fire are: <ul style="list-style-type: none"> fuel heat air.

Course: Field and Crop Preparation 33 (continued)

Concept	Prescribed Specific Outcomes	Notes
Personal Work Skills	<p><i>The student will:</i></p> <ul style="list-style-type: none">• demonstrate employability skills, including:<ul style="list-style-type: none">-- verbal and nonverbal communication– goal setting and career planning– time management– basic financial management.	<p>Students should be advised that their personal work skills will be expected to improve throughout their involvement in the Green Certificate Program.</p> <p>Assessment of personal work skills will be based on growth from previous assessments of personal work skills.</p>

Course: Field Crop and Forage Harvesting 33

Program: Green Certificate

Credits: 5

Corequisite: CTR1210: Personal Safety (Management)

Note: Students are required to complete the corequisite course prior to or concurrent with their enrollment in the first course of the Irrigated Field Crop Production Technician specialization.

Description: Students demonstrate the ability to operate a grain auger, harvest grain and forage crops, operate a swather, operate a combine, store a grain harvest, prepare crop storage facilities, and demonstrate effective and appropriate employability skills.

Parameters: Each of the three courses that constitute the Irrigated Field Crop Production Technician specialization is designed to be delivered off campus. The annual inspection and approval of the work station, and the monitoring, supervision and assessment of each student's progress and performance must be done in accordance with the procedures specified in the Off-Campus Education policy.

Curriculum and Assessment Standards

Prescribed General Outcomes	Assessment Criteria and Conditions	Suggested Emphasis
<i>The student will:</i> <ul style="list-style-type: none">• demonstrate the ability to operate a grain auger• harvest grain crops, by:<ul style="list-style-type: none">– operating a swather– determining moisture levels– demonstrating knowledge of combine operations– operating a combine– storing grain– harvesting equipment– preparing crop storage facilities for harvest	<i>Assessment of student achievement should be based on:</i> <ul style="list-style-type: none">• ongoing assessment of student performance, which is conducted:<ul style="list-style-type: none">– on a daily basis by the student's on-farm trainer in regular consultation with the student's supervising teacher• certification testing, which is conducted by a Green Certificate Assessor designated by AAFRD and includes:<ul style="list-style-type: none">– a performance assessment of practical knowledge and skills– a written examination. <p>Successful completion of this course will be credited toward the attainment of the Irrigated Field Crop Production and/or the Field Crop Production Green Certificate Technician credential.</p>	10% 40%

Course: Field Crop and Forage Harvesting 33 (continued)

[illegible]

Course: Field Crop and Forage Harvesting 33 (continued)

Concept	Prescribed Specific Outcomes	Notes
Planting <ul style="list-style-type: none"> Grain Auger Operation 	<p><i>The student will:</i></p> <ul style="list-style-type: none"> identify and describe the main operating components of a screw-type farm grain auger describe the use or function of each component of a screw-type auger identify the hazards of operating a screw-type auger describe and demonstrate measures to minimize the danger and risk of loss due to hazards describe hazards associated with transporting an auger demonstrate correct procedures to maximize safety when transporting an auger identify parts of an auger requiring periodic service demonstrate proper procedures to maintain an auger identify personal behaviour that can lead to auger accidents describe and demonstrate appropriate safe work habits when operating or servicing an auger identify the components of a chain or paddle-type conveyor—hay bale or cattle feeder type—that are different from auger conveyors describe safe operating and service procedures for chain or paddle-type conveyors identify components of a bucket-type elevator that are different from auger conveyors describe the unique safe operating and service procedures for bucket-type elevators demonstrate proper loading and operation of an auger 	<p>Main operating components of a screw-type auger include:</p> <ul style="list-style-type: none"> auger intake drive mechanism electric, gas, power take-off (PTO) components height adjustment mechanism undercarriage. <p>To minimize hazards when operating an auger, perform appropriate checks to ensure that:</p> <ul style="list-style-type: none"> shields and guards are in place safety catches, cables and electric ground plugs are in proper order hot surfaces are identified. <p>Auger maintenance should include:</p> <ul style="list-style-type: none"> lubricating bearings and chainwheel checking before road travel checking for structural damage and cracks checking for safe operation of lifting mechanism, including catches, cables, safety stops, lubrication.
(continued)		

Course: Field Crop and Forage Harvesting 33 (continued)

Concept	Prescribed Specific Outcomes	Notes
(continued) <ul style="list-style-type: none"> Grain Auger Operation 	<i>The student will:</i> <ul style="list-style-type: none"> demonstrate the proper procedures to transport, position and set up an auger or conveyor used in a grain, fertilizer or forage application. 	
Harvesting Grain Crops <ul style="list-style-type: none"> Swathers 	<ul style="list-style-type: none"> explain the purpose of a swather identify and describe the function and operation of the major components of a swather describe the various controls and adjustments of a swather describe the operation of a swather, and define its operation limits identify and describe the hazards of operating a swather describe key points of good operating practice that will minimize the danger and risk of loss due to hazards perform a check up of a swather prior to start-up perform a daily routine lubrication of a swather describe the effect of canvas speed on swath placement and pattern explain canvas speed and its effect perform adjustments on the speed of the canvas operate the swather in the field to cut and place the crop as desired describe possible factors causing a machine to plug demonstrate proper procedures for clearing a plugged swather demonstrate proper procedures for preparing a swather for transport and for operating a swather on farm and public roads demonstrate proper procedures for removing and replacing a swather canvas 	<p>Components of a swather include:</p> <ul style="list-style-type: none"> reel cutter bar crop divider canvases drivetrain steering mechanism. <p>Hazards associated with swather operation include:</p> <ul style="list-style-type: none"> accidental start-up downhill operations adequate braking power and time fire risks field obstacles exposed drive mechanisms. <p>Performance checks of a swather's operation include ensuring:</p> <ul style="list-style-type: none"> desired cutting height is known and maintained—adapted to crop type and terrain conditions crop is cut evenly and efficiently—no lost crop or wasted travel swathing pattern is carried out smoothly and with efficiency for long windrows, headlands and corners straight, evenly spaced windrows with no misses.
(continued)		

Course: Field Crop and Forage Harvesting 33 (continued)

Concept	Prescribed Specific Outcomes	Notes
(continued)	<i>The student will:</i>	
<ul style="list-style-type: none"> • Swathers 	<ul style="list-style-type: none"> • repair and/or replace knife guards and sickle sections 	
<ul style="list-style-type: none"> • Moisture Levels 	<ul style="list-style-type: none"> • explain the importance of testing moisture levels • explain appropriate times to test for moisture • describe the steps in the process for testing the moisture level of a grain sample • describe what the results indicate • perform any necessary calibrations or machine preparations • demonstrate the proper procedure for obtaining a representative sample that is suitable for testing • demonstrate the correct use of a moisture level tester, and obtain an accurate moisture reading 	<p>Procedure for checking moisture level includes:</p> <ul style="list-style-type: none"> • obtaining material samples • weighing specific contents • performing calibration tests—"zero it" • taking temperature of sample • interpreting the reading or printout.
<ul style="list-style-type: none"> • Combines 	<ul style="list-style-type: none"> • describe/explain the purpose of a combine • identify the major parts and systems of a combine • describe the operation of a combine during threshing • identify items to be included in a mechanical walk-around check of a combine • perform a walk-around check of a combine • locate points on the combine that require greasing and other lubrication • check all components containing fluids and replenish as required • identify the items to be checked in an engine inspection • carry out an inspection of a combine's engine • inspect belts, chains, clutches and other linkages • identify service needs 	<p>The basic operation of a combine includes separating kernels of a crop and leaving straw/hay on the ground.</p> <p>A walk-around check and basic service may include checking:</p> <ul style="list-style-type: none"> • bolts • welds • frame and linkages for damage • sheet metal for holes, tears. <p>Controls on a combine usually include:</p> <ul style="list-style-type: none"> • steering wheel • header height • ground speed • cylinder speed • cylinder spacing • auger placement • return augers • motor controls • air conditioning.
(continued)		

Course: Field Crop and Forage Harvesting 33 (continued)

Concept	Prescribed Specific Outcomes	Notes
(continued)	<i>The student will:</i>	
<ul style="list-style-type: none"> Combines 	<ul style="list-style-type: none"> perform basic servicing, including necessary adjustments, on a combine identify a combine's operation and power train controls describe the proper operation control on a combine identify and describe potential safety hazards describe key points of good operating practice that will minimize the danger and risk of loss due to hazards identify the items to be included in a walk-around check prior to transporting the combine perform the walk-around check perform procedures to prepare a combine for transport start up the combine, and drive it along a road commence crop processing in a field follow combine start-up procedure from the operator manual operate the combine for continuous combining during the day demonstrate correct and safe procedures for unloading a combine into transfer equipment 	<p>Continuous operation of a combine will require the operator to:</p> <ul style="list-style-type: none"> continually monitor operating gauges and controls detect variations in operation make corrective adjustments before damage can occur take swift corrective action, if problems occur maintain and adjust ground speed for crop conditions; e.g., heavy, light, moist, green constantly monitor and adjust pick-up height to suit the crop, field conditions and harvesting intentions.
<ul style="list-style-type: none"> Grain Harvester Storage 	<ul style="list-style-type: none"> identify and describe, for all types of harvesting equipment, main areas of deterioration describe possible problems of long-term storage of grain harvesters list areas of a grain harvester requiring service check equipment, and carry out procedures to store grain harvesting equipment until the next season of use 	

Course: Field Crop and Forage Harvesting 33 (continued)

Concept	Prescribed Specific Outcomes	Notes
<ul style="list-style-type: none"> Crop Storage Facilities 	<p><i>The student will:</i></p> <ul style="list-style-type: none"> inspect crop storage facilities in preparation for harvest use perform a clean-out of storage structures in preparation for storing a new crop describe types of facilities used to store grain check storage facilities identify and assess areas needing repair and maintenance report major needs to supervisor check for protection from moisture; e.g., the roof or cover material identify areas where grain leaks check fencing for possible predators, if there is a protected yard where crops are stored perform basic repairs to storage facilities to prevent water damage to crops. 	<p>Grain storage facilities include:</p> <ul style="list-style-type: none"> grain bins hulls sheds on ground.
<p>Harvesting Forage Crops</p> <ul style="list-style-type: none"> Hay-cutting Equipment <p>(continued)</p>	<ul style="list-style-type: none"> identify types of equipment used to cut hay; e.g.: <ul style="list-style-type: none"> swather disc bine mower conditioner sickle mower identify and describe the operation of major components of hay-cutting equipment identify and describe the hazards to the operator of operating hay-cutting equipment: <ul style="list-style-type: none"> in a field in transport describe operator procedures that will minimize the risk of accident, injury or damage explain the term “areas of control” identify items on hay-cutting equipment that must be controlled or adjusted 	<p>Major operating components of hay-cutting equipment include:</p> <ul style="list-style-type: none"> forage gathering reel or other device cutter bar or other mechanisms forage moving auger or canvases—windrowers drive and power train conditioner/crimper hydraulic controls operator controls.

Course: Field Crop and Forage Harvesting 33 (continued)

Concept	Prescribed Specific Outcomes	Notes
<p>(continued)</p> <ul style="list-style-type: none"> Hay-cutting Equipment <p>(continued)</p>	<p><i>The student will:</i></p> <ul style="list-style-type: none"> describe when to adjust various components on hay-cutting equipment and under what conditions describe the range of adjustments of the following: <ul style="list-style-type: none"> platform flotation evenness cutter bar tilt auger/canvas speed stripper to auger flight spacing reel speed, reel position; e.g., back and forth, up and down reel teeth horizontal and vertical location dump position windrow placement and quality conditioner adjustment on-the-go control—ground speed, cutter bar height, reel height, power take-off (PTO)/rpm establish proper ground speed or crop-feed speed for optimum operation operate hay-cutting equipment in a field to cut and condition a crop identify and describe the frequency and importance of monitoring each component of the hay-cutting equipment perform a field inspection locate and select the points of lubrication and proper lubricants perform lubrication as necessary service and repair reel teeth on swathers and mower conditioners service the cutting components and replace them, when necessary identify desired cutting heights, and adjust height control mechanisms properly 	

Course: Field Crop and Forage Harvesting 33 (continued)

Concept	Prescribed Specific Outcomes	Notes
(continued)	<i>The student will:</i>	
<ul style="list-style-type: none"> Hay-cutting Equipment 	<ul style="list-style-type: none"> describe the effects of the following factors on the kind or width of swath required: <ul style="list-style-type: none"> level of crop heaviness drying speed crop height or length type of machine to follow pick-up and processing capacity of next machine perform the adjustments necessary to obtain the required swath identify problem areas for clogging, and demonstrate correct and safe procedures when clearing obstructions demonstrate correct procedures for setting up hay-cutting equipment for transportation and for operating hay-cutting equipment on a road or lane 	
<ul style="list-style-type: none"> Forage Harvesters 	<ul style="list-style-type: none"> describe the function of a forage harvester identify and describe the function and operation of the major components of a forage harvester identify potential safety hazards, to the operator and to the machine, associated with operating a forage harvester identify and describe operator procedures that can minimize the risk of a personal accident, injury or damage to the machine identify forage harvester control: <ul style="list-style-type: none"> operated on the go set before operation describe the function of each forage harvester control, and identify the normal range of operation of each control operate the harvester in the field to cut and load the crop monitor the operation of the header and feed mechanism 	<p>Major components of a forage harvester include:</p> <ul style="list-style-type: none"> hitch features drivetrain forage heads—pickup feed rolls cutter head stationary knife re-cutter screen, on some models knife sharpener or grinder delivery spout or blower, on some models. <p>Students will be expected to demonstrate:</p> <ul style="list-style-type: none"> initiative in solving problems that arise when operating any baler in a field situation safe practices in operating, inspecting and servicing a baler.
(continued)		

Course: Field Crop and Forage Harvesting 33 (continued)

Concept	Prescribed Specific Outcomes	Notes
<p>(continued)</p> <ul style="list-style-type: none"> Forage Harvesters 	<p><i>The student will:</i></p> <ul style="list-style-type: none"> make on-the-go variations, as required identify operations and controls to be monitored during operation inspect a baler while in a field locate components requiring lubrication, and select the proper lubricants identify the service needs of belts, chains, clutches and other linkages identify the source of operating and performance problems adjust and service the forage harvester, as required demonstrate proper procedures for clearing obstructions demonstrate proper procedures for setting up a forage harvester for transport 	<p>In transporting the equipment, ensure that:</p> <ul style="list-style-type: none"> it is reduced to its minimum size all regulations are followed extra lighting is operated during night transportation speed is kept at an appropriate level equipment is operated in a safe and courteous manner.
<ul style="list-style-type: none"> Square Balers <p>(continued)</p>	<ul style="list-style-type: none"> identify and describe the operation of key components of square balers, including the power train, from hay pickup to a finished bale describe the purpose of a square baler identify the hazards of operating a square baler describe safety measures that will minimize the effect of each hazard identify items on the square baler to be checked or monitored during operation perform a field inspection of a square baler, and adjust items as necessary locate components requiring lubrication perform necessary lubrication identify the service needs of chains, clutches and other mechanical/power linkages adjust and service linkages, as required 	

Course: Field Crop and Forage Harvesting 33 (continued)

Concept	Prescribed Specific Outcomes	Notes
<p>(continued)</p> <ul style="list-style-type: none"> • Square Balers 	<p><i>The student will:</i></p> <ul style="list-style-type: none"> • identify the bale weight and tension requirements, and make the necessary adjustments • demonstrate the proper procedures for rethreading or adding fresh twine • establish the proper ground or crop-feed speed for optimum operation of the baler • monitor the operation of the pickup and feed mechanism, and make adjustments as required • identify problem areas when a baler becomes obstructed in a field • demonstrate proper procedures for clearing obstructions 	
<ul style="list-style-type: none"> • Round Balers 	<ul style="list-style-type: none"> • identify and describe the function and operation of major component parts of a round baler • identify personal safety hazards associated with operating a round baler • describe appropriate measures to minimize hazards and damage to the machine • identify items to be checked or monitored during the operation of a round baler • perform a field inspection of a round baler, and adjust items as necessary • perform lubrication services, as necessary • identify the service needs of chains, clutches and other linkages • adjust and service linkages, as required • identify the bale weight and density requirements of a round baler • assess the quality of bales being produced, and make necessary adjustments to the machine and operating procedure • demonstrate proper procedures for rethreading or adding fresh twine 	
<p>(continued)</p>		

Course: Field Crop and Forage Harvesting 33 (continued)

Concept	Prescribed Specific Outcomes	Notes
<p>(continued)</p> <ul style="list-style-type: none"> Round Balers Hay Rakes 	<p><i>The student will:</i></p> <ul style="list-style-type: none"> establish the proper ground or crop-feed speed for optimum operation of the baler monitor the operation of the pickup and feed mechanism, and make adjustments as required identify potential problem areas for clogging, and demonstrate proper procedures for clearing any obstruction demonstrate proper procedures for: <ul style="list-style-type: none"> starting and forming a round bale twine-wrapping a round bale unloading a round bale setting up and operating a baler in transport describe purpose of a hay rake identify the major components of a hay rake explain the function and operation of each component and define their operational limits identify components of a hay rake requiring adjustment identify items to be checked or monitored during operation locate components requiring lubrication select proper lubricants perform necessary services to a hay rake inspect and service raking teeth identify and describe the quality of hay raking performance perform adjustments necessary to obtain preferred raking performance establish proper ground speed for optimum operation demonstrate proper procedures for preparing and operating a hay rake in transport 	<p>In transporting the equipment, ensure that:</p> <ul style="list-style-type: none"> it is reduced to its minimum size all regulations are followed extra lighting is operated during night transportation speed is kept at appropriate level equipment is operated in a safe and courteous manner.

Course: Field Crop and Forage Harvesting 33 (continued)

Concept	Prescribed Specific Outcomes	Notes
<ul style="list-style-type: none"> Bale Collection Equipment 	<p><i>The student will:</i></p> <ul style="list-style-type: none"> describe the purpose of auto-wagons identify the major components of auto-wagons, and describe their operation and function identify potential safety hazards of operating auto-wagons demonstrate procedures to minimize dangers when operating or servicing an auto-wagon identify areas on an auto-wagon to check prior to start-up, and carry out an inspection identify and describe the function of available controls identify and describe the range of operation of each control use each control to adjust or operate the auto-wagon demonstrate proper procedures to: <ul style="list-style-type: none"> load bales in the field unload and stack bales at the storage site operate the wagon on public roads identify points requiring lubrication and general routine maintenance perform routine and necessary maintenance tasks 	<p>This equipment may not be available on all farms.</p>
<ul style="list-style-type: none"> Storing Forage Crop Harvesting Equipment 	<ul style="list-style-type: none"> identify the main areas of harvesting equipment that tend to deteriorate during long-term storage describe the causes of potential deterioration describe the tools/aids/agents and methods available to protect equipment from deterioration identify and follow proper procedures for seasonal storage of forage crop harvesting equipment 	

Course: Field Crop and Forage Harvesting 33 (continued)

Concept	Prescribed Specific Outcomes	Notes
<ul style="list-style-type: none"> Forage Crop Storage Facilities 	<p><i>The student will:</i></p> <ul style="list-style-type: none"> identify the storage factors and requirements that affect the quality of a harvested crop survey storage facilities, and assess the need for repair and maintenance prepare and maintain storage facilities to be ready to bring in the crop 	<p>Storage facilities require:</p> <ul style="list-style-type: none"> conditions suited to the crop controlled humidity and temperature conditions protection from weather protection from animals effective drainage.
<ul style="list-style-type: none"> Packing Bunker Silage Using a Tractor 	<ul style="list-style-type: none"> describe the purpose of a silage bunker identify potential hazards of operating a silage bunker demonstrate operating procedures to minimize each hazard identify available operating options prepare and adjust a tractor for silage packing operate a tractor to pack silage for quality preservation 	<p>This equipment may not be available on all farms.</p> <p>Potential hazards include:</p> <ul style="list-style-type: none"> rollover loss of control during operation collisions with other harvesting equipment.
<ul style="list-style-type: none"> Silage Dump Wagons 	<ul style="list-style-type: none"> describe the purpose of a silage dump wagon identify and describe the hazards, to the operator and to the equipment, associated with operating a silage dump wagon identify and describe operator procedures that minimize the risk of an accident, injury or damage operate a silage dumpster to harvest and transport silage on fields and on roads locate lubrication points perform necessary service tasks clean up equipment appropriately, and prepare it for long-term storage 	<p>This equipment may not be available on all farms.</p> <p>In preparing a silage dump wagon for storage, ensure that:</p> <ul style="list-style-type: none"> it is properly parked silage is cleaned out metal parts are protected repairs and maintenance are completed.

Course: Field Crop and Forage Harvesting 33 (continued)

Concept	Prescribed Specific Outcomes	Notes
<ul style="list-style-type: none"> Forage Additive Equipment 	<p><i>The student will:</i></p> <ul style="list-style-type: none"> describe the purpose of forage additives identify the main operating features and components of forage additive equipment, and describe their operation identify and describe the hazards, to the operator and to the equipment, associated with operating forage additive equipment describe operator procedures that minimize the risk of an accident, injury or damage prepare and set up available forage additive equipment for a harvesting operation monitor an applicator for proper operation locate components requiring lubrication and periodic service perform necessary lubrication and basic maintenance services clean up the equipment after use, and prepare for off-season storage. 	<p>This equipment may not be available on all farms.</p> <p>Main operating components include:</p> <ul style="list-style-type: none"> material feeder mechanism power source operator controls.
<p>Personal Work Skills</p>	<ul style="list-style-type: none"> demonstrate employability skills, including: <ul style="list-style-type: none"> verbal and nonverbal communication goal setting and career planning time management basic financial management. 	<p>Students should be advised that their personal work skills will be expected to improve throughout their involvement in the Green Certificate Program.</p> <p>Assessment of personal work skills will be based on growth from previous assessments of personal work skills.</p>

RESOURCES

The Green Certificate Program is supported by a variety of resources, including:

- *Off-campus Education Guide for Administrators, Counsellors and Teachers*, Alberta Education, 1997
- *Career Transitions Guide to Standards and Implementation*, Alberta Education, 1997
- *Beef Herd Operations: Cow–Calf Production Technician Skill Profile and Performance Standards*, AAFRD, Current Edition
- *Dairy Production Technician Skill Profile and Performance Standards*, AAFRD, Current Edition
- *Feedlot Production Technician Skill Profile and Performance Standards*, AAFRD, Current Edition
- *Field Crop Technician Skill Profile and Performance Standards*, AAFRD, Current Edition
- *Irrigated Field Crop Technician Skill Profile and Performance Standards*, AAFRD, Current Edition
- *Irrigated Field Crop Production Technician Skill Profile and Performance Standards*, AAFRD, Current Edition
- *Sheep Production Technician Skill Profile and Performance Standards*, AAFRD, Current Edition
- *Swine Farrow to Finish Production Technician Skill Profile and Performance Standards*, AAFRD, Current Edition
- Other specialization-related resources as listed in the current AAFRD Publications Guide.

